

CLAIMS

WHAT IS CLAIMED IS:

1 1. A method for preventing unauthorized use of roaming numbers in a wireless
2 telecommunications system, said method comprising the steps of:
3 receiving a call request for a mobile terminal at a Gateway Mobile Switching
4 Center (GMSC);
5 sending a request for routing information from said GMSC to a Home
6 Location Register (HLR) associated with said mobile terminal;
7 sending a request for a roaming number from said HLR to the Mobile
8 Switching Center (MSC) associated with the roaming area in which said mobile
9 terminal is geographically located;
10 allocating a roaming number for said mobile terminal;
11 assigning an authentication code to said roaming number;
12 sending a response to said request for roaming number from said MSC to
13 said HLR, said response including said roaming number and said authentication
14 code;
15 receiving said roaming number and said authentication code at said HLR;
16 sending said roaming number and said authentication code from said HLR
17 to said GMSC;

18 sending a call setup request from said GMSC to said MSC, said call setup
 19 request including said roaming number and said authentication code;
 20 confirming said authentication code in said call setup request; and,
 21 if said authentication code for said roaming number is confirmed, completing
 22 said call request to said mobile terminal.

1 2. The method recited in Claim 1, wherein said authentication code is a
 2 function of said roaming number.

1 3. The method recited in Claim 1, wherein said authentication code is a function
 2 of the time at which said roaming number is requested.

1 4. The method recited in Claim 1, wherein said authentication code is a function
 2 of the date on which said roaming number is requested.

1 5. A wireless telecommunications system Mobile Switching Center (MSC)
2 adapted to prevent unauthorized use of roaming numbers, said MSC operative to:
3 receive a request for a roaming number from a Home Location Register
4 (HLR) associated with a mobile terminal located within the geographical service
5 area of said MSC;
6 allocate a roaming number for said mobile terminal;
7 assign an authentication code to said roaming number;
8 send a response to said request for roaming number from said MSC to said
9 HLR, said response including said roaming number and said authentication code,
10 said HLR relaying said roaming number and said authentication code to a Gateway
11 Mobile Switching Center (GMSC) that has received a call request for said mobile
12 terminal;
13 receive a call setup request from said GMSC, said call setup request
14 including said roaming number and said authentication code;
15 confirming said authentication code in said call setup request; and,
16 if said authentication code for said roaming number is confirmed, completing said
17 call request to said mobile terminal.

1 6. The MSC recited in Claim 5, wherein said authentication code is a function
2 of said roaming number.

1 7. The MSC recited in Claim 5, wherein said authentication code is a function
2 of the time at which said roaming number is requested.

1 8. The MSC recited in Claim 5, wherein said authentication code is a function
2 of the date on which said roaming number is requested.

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1 9. A wireless telecommunications system Gateway Mobile Switching Center
2 (GMSC) adapted to prevent unauthorized use of roaming numbers, said GMSC
3 operative to:

4 receive a call request for a mobile;

5 send a request for routing information to a Home Location Register (HLR)
6 associated with said mobile terminal, said request for routing information causing
7 said HLR to send a request for a roaming number to a Mobile Switching Center
8 (MSC) associated with the roaming area in which said mobile terminal is
9 geographically located, said request for a roaming number causing said MSC to
10 allocate a roaming number for said mobile terminal, assign an authentication code
11 to said roaming number, and send a response to said request for roaming number
12 to said HLR, said response including said roaming number and said authentication
13 code;

14 receive said roaming number and said authentication code from said HLR;

15 sending a call setup request from said GMSC to said MSC, said call setup
16 request including said roaming number and said authentication code, said MSC
17 completing said call request only upon confirming said authentication code for
18 said roaming number.

1 10. The GMSC recited in Claim 9, wherein said authentication code is a function
2 of said roaming number.

1 11. The GMSC recited in Claim 9, wherein said authentication code is a function
2 of the time at which said roaming number is requested.

1 12. The GMSC recited in Claim 9, wherein said authentication code is a function
2 of the date on which said roaming number is requested.

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1 13. A wireless telecommunications system Home Location Register (HLR)
2 adapted to prevent unauthorized use of roaming numbers, said HLR operative to:
3 receive a request for routing information from a Gateway Mobile Switching
4 Center (GMSC), said request for routing information identifying a mobile terminal
5 associated with said HLR for which said GMSC has received a call request;
6 sending a request for a roaming number from said HLR to the Mobile
7 Switching Center (MSC) associated with the roaming area in which said mobile
8 terminal is geographically located, said request for a roaming number causing said
9 MSC to allocate a roaming number for said mobile terminal, assign an
10 authentication code to said roaming number, and send a response to said request
11 for roaming number to said HLR, said response including said roaming number and
12 said authentication code;
13 receiving said roaming number and said authentication code at said HLR;
14 sending said roaming number and said authentication code from said HLR
15 to said GMSC, whereupon said GMSC can send a call setup request from said
16 GMSC to said MSC, said call setup request including said roaming number and said
17 authentication code, said MSC completing said call request only upon confirming
18 said authentication code for said roaming number.

1 14. The HLR recited in Claim 13, wherein said authentication code is a function
2 of said roaming number.

1 15. The HLR recited in Claim 13, wherein said authentication code is a
2 function of the time at which said roaming number is requested.

1 16. The HLR recited in Claim 13, wherein said authentication code is a function
2 of the date on which said roaming number is requested.

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